

a long one or a short one, the numerous paths of rapid movement and short duration, outweigh those of slow movement and long duration. If the movement of a center of high or low pressure depends upon the general movement of the upper layers of atmosphere, or is in any way a partial index to the velocity of the general circulation, then from that point of view, the averages taken by days are to be preferred. The average daily movement in 1895 was 556 miles for the high areas and 598 for the low, or an average of 577; in the current year the above table shows average daily velocities in both cases 5 miles larger than the preceding year, giving an average of 582, or about 24 miles per hour. This average undoubtedly gives us a first approximation to the annual average velocity of the wind at some upper level, probably between 5,000 and 10,000 feet, but nearer the latter. If studied in connection with a system of upper isobars such as that shown on Chart VII, of the November REVIEW, they seem to harmonize with the general statement that our high and low areas and weather changes form part of the system of circulation around the north Polar Region of low pressure.

TABLE A.—Movements of areas of high and low pressure for 1896.

Month.	High areas.				Low areas.			
	By paths.		By days.		By paths.		By days.	
	No.	Movement.	No.	Movement.	No.	Movement.	No.	Movement.
		<i>Miles.</i>		<i>Miles.</i>		<i>Miles.</i>		<i>Miles.</i>
January.....	10	5,317	45.5	21,880	9	5,435	38.0	21,890
February.....	14	9,931	50.0	33,950	7	4,447	34.5	20,260
March.....	8	4,512	39.0	22,460	10	6,693	42.0	26,760
April.....	6	3,086	36.0	13,430	9	5,093	36.5	20,330
May.....	7	3,941	33.0	18,520	10	5,075	41.5	19,960
June.....	7	3,965	44.5	24,470	8	4,820	35.0	20,350
July.....	7	3,734	22.0	11,660	11	6,302	28.5	22,550
August.....	6	3,234	39.0	20,950	10	6,617	34.0	22,360
September.....	7	4,148	39.0	22,900	11	6,631	30.0	22,320
October.....	10	5,244	44.0	22,530	9	4,932	35.0	18,060
November.....	5	3,307	22.5	13,810	8	6,491	33.5	25,250
December.....	8	4,754	32.5	18,390	12	9,171	43.0	31,530
Sums.....	95	55,123	437.0	244,950	114	71,407	450.5	271,560
Mean daily velocity.....		580		561		626		603
Mean hourly velocity.....		24.2		23.4		26.1		25.1

TEMPERATURE.

The mean annual temperature is shown by the isotherms on Chart I. These temperatures relate to the surface of the ground, and the individual figures are given in Table I of the annual meteorological summary of data for Weather Bureau stations. The lowest annual averages within the United States were: Williston, 37.6; Moorhead, 37.7; Bismarck, 38.9; Sault Ste. Marie, 39.5; Duluth, 39.6; Havre, 39.7. For Canada: Prince Albert, 30.5; Battleford, 31.1; White River, 31.2; Minnedosa, 31.6. The highest averages were: Key West, 76.4; Jupiter, 73.4; Yuma, 73.1; Tampa, 71.4; for Canada, Halifax, 43.2; Charlottetown, 43.1; Yarmouth, 43.0.

The mean annual temperature was above the normal at nearly all stations. The largest departures were in the middle Slope and the west Gulf States. The annual temperatures were below normal in the Florida Peninsula and on the north Pacific Coast and in portions of New England.

The maximum temperatures are shown both by the figures in Table I and the full lines on Chart II; the minimum temperatures of the year are shown by the figures in Table I and the dotted lines on the same chart. The absolute range of temperature during the year is easily obtained by comparing the full and dotted lines on this chart. In general maximum temperatures exceeding 105, occurred as follows: Yuma, 117; Phoenix, 115; Fresno, 111; Red Bluff, 109; Fort Smith, 107; Shreveport and Wichita, 106. The absolute maximum for the whole country was 117 at Yuma. Minimum temperatures of

—25 or more occurred at: Havre, —33; Lander, —31; Northfield, —30; Moorhead, —28; Williston and Idaho Falls, —26; Sault Ste. Marie, Duluth, Miles City, —25.

The regions of large annual ranges of temperature were, as usual, the north, middle, and south Pacific slopes and the Missouri Valley. The stations of small annual range were: Hatteras, 76; Key West, 38; Tatoosh Island, 48; Eureka, 45; Point Reyes Light, 51.

The accumulated departures of average monthly temperatures from the normal values are given in Table III, and show that there was a steady diminution in the deficit with which the year began in the Atlantic and Gulf States, generally turning into a surplus before the end of the year. In other sections of the country the year began with an excess of temperature which generally increased steadily until the close. The greatest deficits for the year were: —0.77, Florida Peninsula. The greatest excesses for the year were: the middle Slope, +2.07; Abilene, +2.19.

MOISTURE.

The mean temperature of the dew-point and of the mean relative humidity are given in Table I.

For the sake of certain studies in hygiene the mean temperature of the wet-bulb thermometer has been given each month. The thermometer from which this temperature is read is whirled at the rate of about 10 feet per second within the light wooden shelter that protects from direct radiation. The average wet-bulb for the year can be easily inferred from the mean temperature and dew-point of Table I as the wet-bulb reading is approximately midway between these two.

The total quantity of moisture in the air for the current year can be found by the table given on pages 539–540 of the ANNUAL SUMMARY for 1894, and does not differ to any important extent from the figures there given for that year.

PRECIPITATION.

The total annual fall of rain and melted snow for 1896 is shown on Chart III. The greatest precipitation was: Tatoosh Island, 100.8; Astoria, 94.8; Fort Canby, 78.6; East Clallam, 78.1. The least was: Yuma, 2.6; San Diego, 8.7; El Paso, 9.3; Pueblo, 10.8.

An annual rainfall above 60 inches occurred on small portions of the coast of Florida and Alabama, Nova Scotia, and Newfoundland, as also along the entire coast of Oregon and Washington. An annual rainfall of less than 10 inches occurred in southern California, Nevada, Utah and Colorado, western New Mexico, and northern Arizona.

The accumulated departures of total monthly precipitation from the normal values are shown in Table IV, from which it appears that a steadily increasing deficit has prevailed over the Atlantic States, Ohio Valley, and Lake Region; but elsewhere a slight excess has accumulated. The large total annual deficits are the west Gulf States, 12.50; South Atlantic States, 10.70. The largest accumulated excess was north Pacific, 10.10.

WIND.

The prevailing direction of the wind, namely that which occurred most frequently at the two hours of regular observations for telegraphic report, 8 a. m. and 8 p. m. (eastern time) is given in Table I. The annual resultant wind deduced from these same observations without taking into account the force of the wind (which is equivalent to attributing a uniform force to all winds) is given in Table V. These resultants are also presented graphically on Chart I in connection with the barometric means. They should also be compared with the pressures on Charts IV and V to which they are intimately related.

Owing to the great labor of computation the resultant